

CLAIMS

Having thus described our invention in detail, what we claim as new and desire to secure by the Letters Patent is:

1. An interconnect structure comprising:

a semiconductor substrate comprising one or more device regions; and

one or more interconnect levels located atop the semiconductor substrate, said one or more interconnect levels comprising a patterned organosilicate dielectric having sidewalls, wherein said sidewalls are not substantially altered either chemically or physically.

2. The interconnect structure of Claim 1 wherein said patterned organosilicate dielectric has a dielectric constant of less than 4.0.

3. The interconnect structure of Claim 1 wherein said one or more interconnect levels include metal lines and vias.

4. The interconnect structure of Claim 3 wherein the metal lines and vias comprise a conductive material.

5. The interconnect structure of Claim 1 wherein said one or more interconnect levels form a thinwire interconnect structure.

6. The interconnect structure of Claim 1 wherein said one or more interconnect levels form a thinwire interconnect structure.

7. The interconnect structure of Claim 1 wherein said one or more device regions comprise a field effect transistor.

8. A process of fabricating a patterned organosilicate dielectric comprising:
providing an interconnect structure comprising at least one organosilicate dielectric interlevel;

patterning the at least one organosilicate dielectric interlevel using a photoresist to provide at least one opening having sidewalls in said at least one organosilicate dielectric interlevel; and

removing the photoresist using an in-situ inert gas/H₂ ash process, said in-situ inert gas/H₂ ash process does not substantially alter the sidewalls of the at least one opening either chemically or physically.

9. The process of Claim 8 wherein said inert gas comprises He, Ne, Xe, Ar, Kr, Xe or mixtures thereof.

10. The process of Claim 8 wherein said inert gas is He.

11. The process of Claim 8 wherein said inert gas/H₂ ash process is carried out in a plasma.

12. The process of Claim 11 wherein the plasma comprises about 90% or greater H₂ and about 10% or less of inert gas.

13. The process of Claim 12 wherein the plasma comprises about 90 to about 99.99% H₂ and about 10 to about 0.01% of inert gas.

14. The process of Claim 8 wherein the inert gas/H₂ ash process is carried out at a pressure of about 0.75 to about 1 Torr, a flow rate of about 450 to about 500 sccm H₂ and from about 10 to about 50 sccm inert gas, a source power of from about 450 to about 600 W, and a bias power of less than about 50W.

15. An ash process comprising the steps of:

positioning a substrate in a chamber;

supplying said chamber with an atmosphere of H₂ and an inert gas; and

forming a plasma in said chamber from said atmosphere whereby said substrate is exposed to said plasma.

16. The process of Claim 15 wherein said inert gas comprises He, Ne, Xe, Ar, Kr, Xe or mixtures thereof.

17. The process of Claim 15 wherein said inert gas is He.

18. The process of Claim 15 wherein said inert gas/H₂ ash process is carried out in a plasma.

19. The process of Claim 15 wherein the plasma comprises about 90% or greater H₂ and about 10% or less of inert gas.

20. The process of Claim 15 wherein the inert gas/H₂ ash process is carried out at a pressure of about 0.75 to about 1 Torr, a flow rate of about 450 to about 500 sccm H₂ and from about 10 to about 50 sccm inert gas, a source power from about 450 to about 600 W, and a bias power of less than about 50W.